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(56) Documents cited

GB 2000276 A

GB 1474033 A

GB 0553038 A

GB 0389847 A

GB 0380352 A

GB 0266152 A

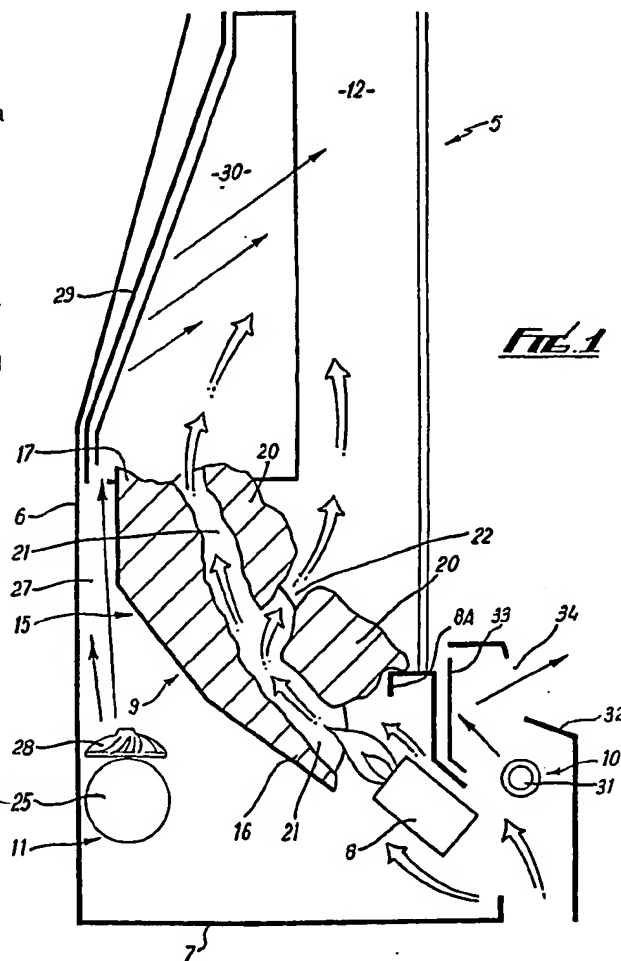
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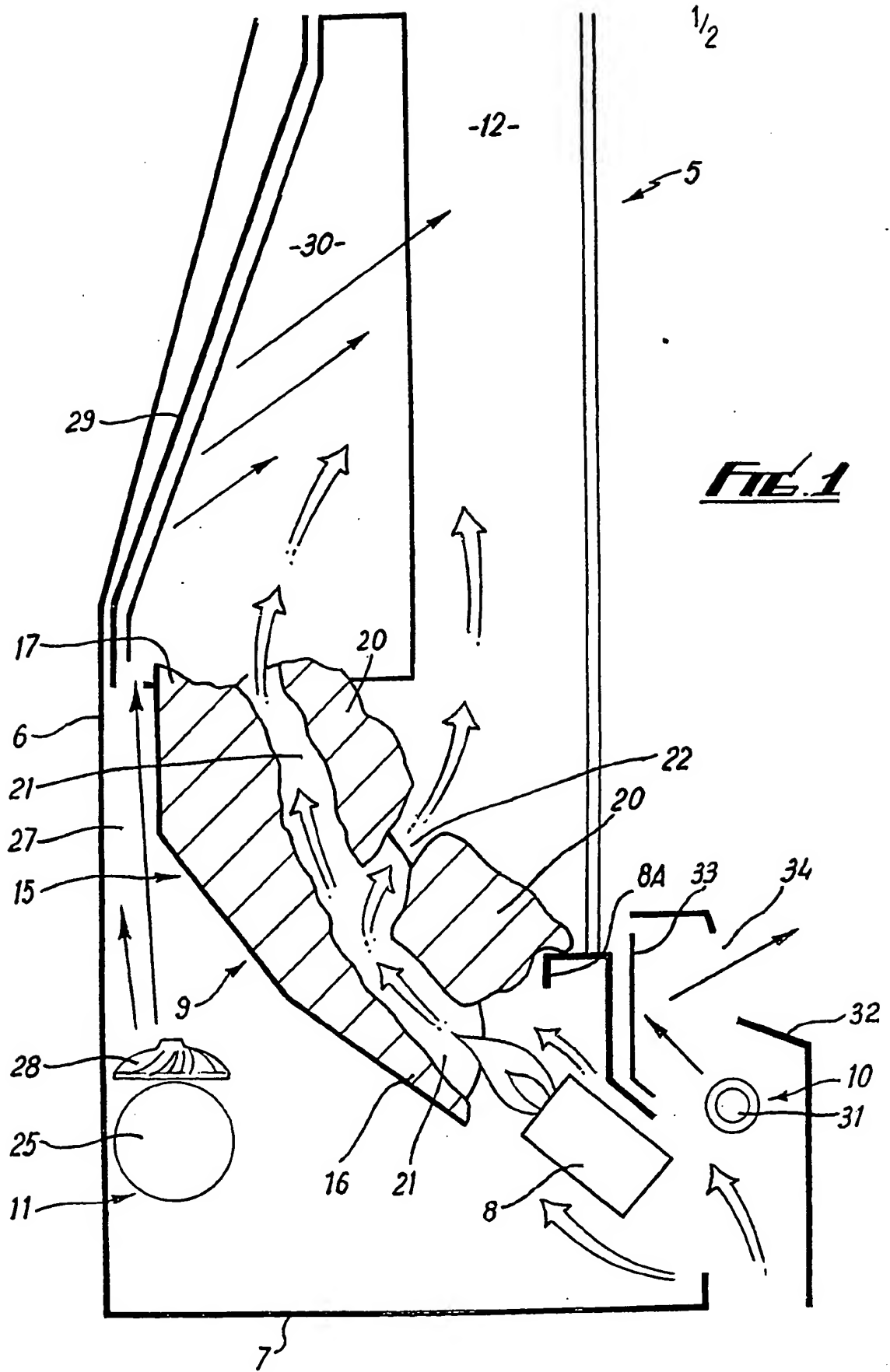
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(54) **Simulated solid fuel gas fires**

(57) A simulated live fuel assembly for a gas-fired heating appliance comprises a base element 15 of unitary construction incorporating a lower forward portion 16 and a rear portion 17 projecting upwardly from the lower portion, together with single or plural upper elements 20 extending over and spaced from the base element to define between them a passage 21 having an inlet opening at the lower forward region of the assembly, outlet openings 22 being formed in or by the upper element and/or between same and the rear portion 21 of the base element, and the upper surface of the upper element(s) comprising simulated fuel formations. The rear portion 17 may terminate in simulated fuel formations. The elements 15, 20 are made of ceramic fibre material. Light bulbs 25, 31 are provided. Also disclosed is a reflector assembly 29, 30 comprising stainless steel sheet material having a mottled or patterned surface which may be employed with the above or other forms of live fuel effect assembly. The surface may be deformed to produce diamond or circular shaped recesses and projections.



29-1 reflectors
 30-1 w/ mottled
 or patterned
 surface
 diamond or circular
 shaped



2/2

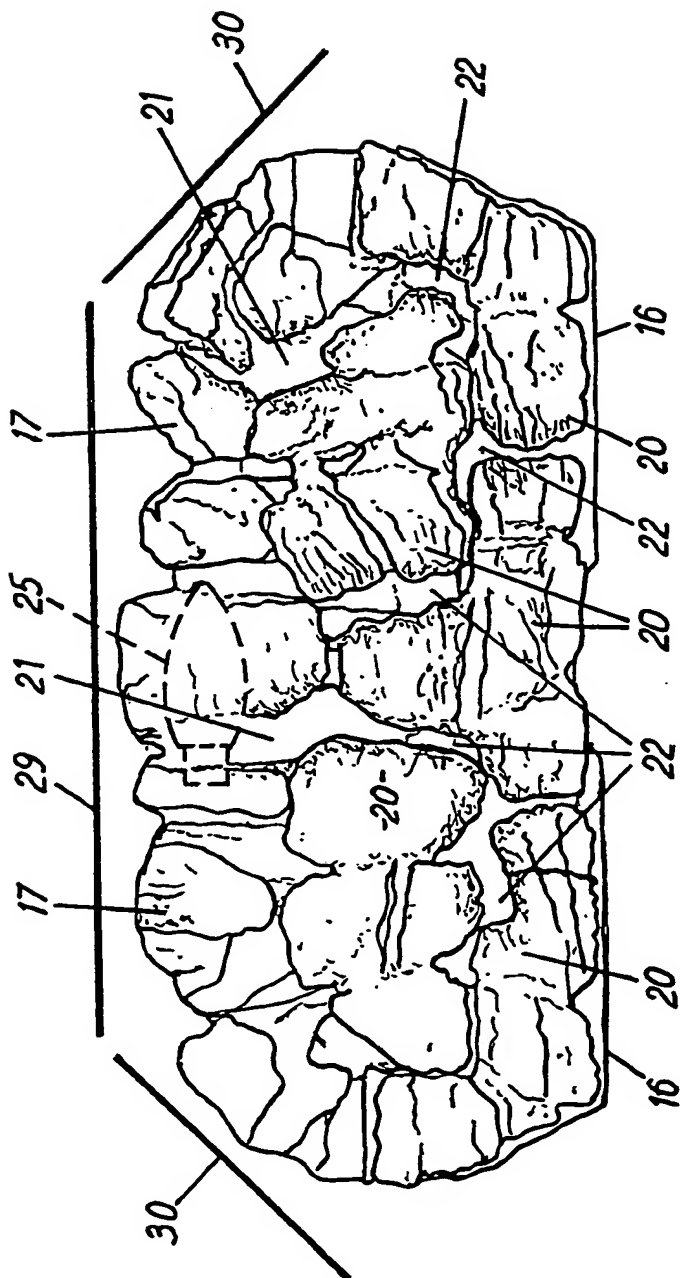


FIG. 2

Simulated Fuel Unit

The invention relates to simulated fuel units for gas-fired heating appliances.

Gas-fired heating appliances offer substantial benefits compared with other forms of heating. However there is a desire on the part of consumers that gas-fired appliances should resemble coal or log fires and much work has been done with a view to producing appliances having a realistic live fuel effect (so called LFE appliances). Previous attempts have met with varying degrees of success but there remains a need to improve the LFE effect of gas-fired appliances and it is an object of the present invention to provide an improved fuel effect unit for such appliances.

The invention provides a simulated live fuel effect assembly for a gas-fired heating appliance comprising a base element of unitary construction incorporating a lower forward portion and a rear portion projecting upwardly from the lower portion, and an upper element extending over and spaced from said base element to define between the base and upper elements a passage having an inlet opening at the lower forward region of the assembly, outlet openings being formed in said upper element and/or between same and the rear portion of said base element, and the upper surface of the said upper

element comprising simulated fuel formations.

Preferably said upper element defines a series of flame apertures at spaced locations through which flames entering the assembly at said inlet opening and deflected upwardly by the rear portion of said base element may leave the assembly.

The upper element is preferably at least partly supported on said base element and may advantageously comprise a plurality of individual components placed on the forward portion of said base element with spaces between the individual components defining said flame apertures.

Preferably the rear portion of said base element terminates in simulated fuel formations.

Preferably also said elements are constructed from ceramic material, preferably fibrous ceramic material, which will become incandescent and glow when subjected to gas flames in use.

Advantageously the effect is enhanced by the provision to the rear of the assembly of an illuminating device comprising a flickering light source. The light source preferably comprises a light bulb and a movable

member mounted adjacent said bulb and movable by
convected heat rising from the bulb.

Preferably the light source is disposed at a level below that of the rear portion of said base element and is adapted to direct light upwardly behind the assembly. Advantageously reflector means is provided to reflect light from the light source upwardly and forwardly over the assembly.

The reflector means preferably comprises reflective sheet material having a mottled or patterned surface. Reflector means of this kind may be employed in association with alternative forms of heating appliance incorporating different fuel effect assemblies. Thus according to a further aspect of the invention there is provided reflector means for use in association with a simulated live fuel effect assembly for a gas-fired heating appliance, the reflector means comprising reflective sheet material having a mottled or patterned surface.

Advantageously said sheet material comprises stainless steel but other reflective materials may be employed. The mottled or patterned surface is preferably produced by deformation of the surface of the sheet to form series of recesses and projections. These

are advantageously of a generally uniform size and may be of diamond, circular or other shape. The recesses and projections preferably cover the whole surface of the sheet.

The reflector means preferably comprises a rear reflector member adapted to be located behind the live fuel effect assembly and side reflector members diverging forwardly from the rear reflector member.

Additional illumination may be provided by a further light source located forwardly of the assembly at a low level and adapted to illuminate the front of the assembly.

The invention also provides a gas-fired heating appliance incorporating a simulated live fuel effect assembly and/or reflector means as aforesaid.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying diagrammatic drawings, in which:-

Fig. 1 is a cross-section through a gas-fired heating appliance incorporating a simulated fuel effect assembly according to the invention; and


Fig. 2 is a plan view.

Referring to the drawings, the appliance comprises a casing 5 having a back 6 and base 7 within which is mounted a burner assembly 8, a simulated fuel effect assembly 9, front and rear lighting units 10 and 11 and a flue assembly 12 which may incorporate a heat exchanger (not shown). In use of the appliance a gas/air fuel mixture is combusted at the burner assembly 8, generating gas flames which burn in the region of the fuel effect assembly 9, the products of combustion leaving the appliance by way of the flue assembly 12 to an outlet (not shown) connected to a chimney or flue.


The fuel effect assembly comprises a unitary base element 15 having a lower forward portion 16 extending into an upwardly directed rear portion 17, the upper surface of which is formed to simulate lumps of coal. Mounted on the base element 15 is an upper element comprising a plurality of separate components 20 supported on the base element and on the burner housing 8A in such manner as to define a passage 21 between the base and upper elements. The components 20 are also spaced from one another to define through openings 22 forming flame apertures through which flames from the burner 8 may emerge. The upper surfaces of the components 20 are formed to simulate coal lumps such

that these components together with the rear portion 17 of the base element 15 together simulate a coal fuel bed when viewed from the front of the appliance.

The rear lighting unit 11 is mounted behind and below the fuel effect assembly 9 and comprises a light bulb 25 surmounting a curved reflector (not shown) adapted to reflect light from the bulb 25 upwardly through a passage 27 at the rear of the fuel effect assembly 9. Rotatably mounted within the passage 27 is a spinner 28 of lightweight aluminium construction which rotates under the effect of the heated air rising from the bulb 25 and produces a flickering effect. Light directed upwardly behind the assembly 9 is reflected upwardly and forwardly over the assembly by reflector means comprising a main or back reflector 29 and side reflectors 30. Viewed from the front of the appliance the reflected light supplements and enhances the effect of the fuel effect assembly itself.



The reflectors 29 and 30 are constructed from stainless steel sheet material having a mottled or patterned surface produced by deformation of the sheet to form series of raised portions and depressions extending over the whole surface of the sheet. The deformations are preferably of generally diamond shape and of uniform size having a major dimension of around



x 1
5-10 mm. and a minor dimension of around 2-5 mm. It has been found construction of the reflectors in this way distorts the reflected light and ensures the outline of the bulb 25 is not visible in the reflectors.

The front lighting unit 10 comprises a bulb 31 mounted in a housing 32 located forwardly of the fuel effect assembly 9 and operable to direct light upwardly and rearwardly to a reflector 33 visible through an aperture 34 in the housing 32 to enhance the overall illumination effect. The reflector 33 may be mottled or patterned in a manner similar to the reflectors 29 and 30 if desired.

The base and upper elements of the fuel effect unit are constructed from ceramic fibre material which becomes incandescent and glows when heated in the manner of real coal. Thus in use of the appliance, gas flames emitted from the burner 8 enter the fuel effect assembly at the lower forward edge thereof into the space 21 defined between the upper surface of the lower element 15 and the undersurface of the upper element formed by the components 20. Flames find their way out of the assembly through the flame apertures 22, through which they are diverted by virtue of the upstanding rear portion 17 of the base element 16, and through the gap between the base and upper elements at the upper end of

the assembly.

Due to the relatively narrow configuration of the passage 21, the flames cause incandescence of the upper surface of the base element 16 and of the upper elements, particularly at the regions of the flame apertures 22. There is therefore a combined incandescent effect which, when viewed from the front of the appliance gives the effect of individual incandescent coals mounted upon a hot fuel bed as in the case of a real coal fire.

The effect is supplemented and enhanced by the flickering light generated by the lighting unit 10 which adds additional movement to the flame effect but is not ascertainable as a light source as such due to its being positioned behind the assembly through which the gas flames themselves are emitted. As a result an extremely realistic live fuel effect is produced.

Various modifications may be made without departing from the invention. For example the shape and configuration of the fuel bed elements may be varied subject to their being a lower base portion having an upstanding rear component and subject to the upper surface of the upper component being formed to simulate live fuel. In this respect while in the illustrated

embodiment the elements are formed to resemble coal, they may equally be formed to resemble logs or other fuel. The upper components may be combined to form a unitary upper element provided with a number of flame apertures and supported on the lower element or on suitable supports in the casing of the appliance.

While in the illustrated embodiment the reflector members 29 and 30 are of mottled or patterned form, they may be of plain construction if desired. The reflectors may also be formed from reflective sheet material other than stainless steel and the surface deformations may be of circular, random or other shape and of various sizes dependent on the visual effect required. Moreover while the light units are preferred to enhance the overall effect, either or both may be omitted if desired. The mottled or patterned reflector means may also be employed in fires of different construction and incorporating different forms of live fuel effect assembly.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims:-

1. A simulated live fuel effect assembly for a gas-fired heating appliance comprising a base element of unitary construction incorporating a lower forward portion and a rear portion projecting upwardly from the lower portion, and an upper element extending over and spaced from said base element to define between the base and upper elements a passage having an inlet opening at the lower forward region of the assembly, outlet openings being formed in said upper element and/or between same and the rear portion of said base element, and the upper surface of the said upper element comprising simulated fuel formations.

2. A simulated live fuel effect assembly according to claim 1 wherein said upper element defines a series of flame apertures at spaced locations through which flames entering the assembly at said inlet opening and deflected upwardly by the rear portion of said base element may leave the assembly.

3. A simulated live fuel effect assembly according to claim 1 or 2 wherein said upper element is at least partly supported on said base element.

4. A simulated live fuel effect assembly according to claim 3 wherein said upper element comprises a plurality of individual components placed on the forward portion of said base element with spaces between the individual components defining said flame apertures.

5. A simulated live fuel effect assembly according to any preceding claim wherein the rear portion of said base element terminates in simulated fuel formations.

6. A simulated live fuel effect assembly according to any preceding claim wherein said elements are constructed from material which will become incandescent and glow when subjected to gas flames in use.

7. A simulated live fuel effect assembly according to claim 6 wherein said elements are constructed from fibrous ceramic material.

8. A simulated live fuel effect assembly according to any preceding claim including an illuminating device comprising a flickering light source disposed to the rear of the assembly.

9. A simulated live fuel effect assembly according to claim 8 wherein said light source comprises a light bulb and a movable member mounted adjacent said bulb and

movable by convected heat rising from the bulb.

10. A simulated live fuel effect assembly according to claim 9 wherein said light source is disposed at a level below that of the rear portion of said base element and is adapted to direct light upwardly behind the assembly.

11. A simulated live fuel effect assembly according to any of claims 8 to 10 including reflector means to reflect light from said light source upwardly and forwardly over the assembly.

12. A simulated live fuel effect assembly according to claim 11 wherein said reflector means is formed from reflective sheet material having a mottled or patterned surface.

13. Reflector means for use in association with a live fuel effect assembly for a gas-fired heating appliance, the reflector means comprising reflective sheet material having a mottled or patterned surface.

14. Reflector means according to claim 12 or 13 wherein said sheet material comprises stainless steel.

15. Reflector means according to any of claims 12 to 14 wherein said surface is produced by deforming the

surface of the sheet material to form series of raised portions and depressions.

16. Reflector means according to any of claims 12 to 15 wherein said mottled or patterned effect comprises a plurality of areas of generally diamond shape.

17. Reflector means according to any of claims 12 to 16 wherein said mottled or patterned areas are distributed over the whole surface of said sheet material.

18. Reflector means according to any of claims 12 to 17 comprising a rear reflector member adapted to be located behind said live fuel effect assembly and side reflector members diverging forwardly from said rear reflector member.

19. Reflector means for use with a live fuel effect assembly for a gas-fired heating appliance substantially as hereinbefore described.

20. A gas-fired heating appliance incorporating reflector means according to any of claims 12 to 19.

21. A simulated live fuel effect assembly according to any of claims 1 to 19 including a light source located

forwardly of the assembly at a low level and adapted to illuminate the front of the assembly.

22. A simulated live fuel effect assembly substantially as hereinbefore described with reference to the accompanying drawings.

23. A gas-fired heating appliance incorporating a simulated live fuel effect assembly according to any of claims 1 to 19, 21 or 22.

24. Any novel subject matter or combination including novel subject matter disclosed in the foregoing specification or claims and/or shown in the drawings, whether or not within the scope of or relating to the same invention as any of the preceding claims.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

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Relevant Technical fields

- (i) UK Cl (Edition K) F4W
- (ii) Int Cl (Edition 5) F24C 3/00

Search Examiner

A N BENNETT

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

24.12.92

Documents considered relevant following a search in respect of claims 1-7, 23

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2000276 A (UNITED GAS) whole document	1-7, 23
X	GB 1474033 (MAIN GAS) whole document	1-4, 6, 7, 23
X	GB 0553038 (RADIATION LTD) whole document	1-4, 6, 7, 23
X	GB 0389847 (RADIATION LTD) whole document	1-4, 6, 7, 23
X	GB 0380352 (S METROP. GAS) whole document	1-4, 6, 7, 23
X	GB 0266152 (S METROP. GAS) see especially figure 3	1-7, 23

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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